

Russell Group evidence to Science and Technology Committee inquiry into Science budget and Industrial Strategy

1. Summary

- Russell Group universities are ready and well placed to support the Government in delivering economic growth and wider social benefits through world-class research and innovation, by fostering collaborative partnerships that encourage and draw in investment from business and others, and by providing a pool of high-level graduate and postgraduate skills to boost productivity.
- The commitment of £4.7 billion additional R&D investment over this parliament is very welcome and we want to ensure its impact is maximised for the future. The extraordinary value of fundamental basic research for the long-term innovation pipeline needs to be recognised with enhanced support for QR funding (and its equivalents in the Devolved Administrations). This funding complements the challenge-focused approach of the new Industrial Strategy Challenge Fund.
- We welcome the recommendation to boost the Charity Research Support Fund (CRSF) that was made recently in the Life Sciences Industrial Strategy¹ – this funding allows the UK to benefit from significant additional investment by leading research charities that might otherwise go overseas.
- Russell Group universities are highly successful in the commercial exploitation of their research, but we recognise the Government’s ambition to boost the UK’s performance in taking ideas from lab to market. HEIF is particularly important in this respect and we would support this fund being increased further – and for similar funds to be made available consistently across all parts of the UK
- Universities are central to delivering the range of skills, qualifications and training needed to drive productivity and growth. Ensuring adequate funding for high-cost subjects such as STEM and medicine is necessary to underpin quality and growth in this high-level skills pipeline.
- Our strengths in research and innovation depend on attracting talent and expertise from all over the world – from academics and researchers, to specialists, analysts, technicians and students. The UK needs a light-touch, fair and transparent immigration system to deliver on the Government’s commitment for the UK to remain “a magnet for international talent and a home to the pioneers and innovators who will shape the world ahead”.²
- We welcome the Government’s desire to secure an ambitious agreement with the EU on science and innovation cooperation; this should include continued UK participation in Horizon 2020 to the end of the programme and access to and influence over future EU research and innovation programmes and infrastructures with a focus on excellence.

¹ Life Sciences Industrial Strategy (Aug 2017)

² ‘The United Kingdom’s exit from, and new partnership with, the European Union’, HMG (February 2017).

2. Context

- 2.1 The purpose of The Russell Group is to provide strategic direction, policy development and communications for 24 major research-intensive universities in the UK; we aim to ensure that policy development in a wide range of issues relating to higher education is underpinned by a robust evidence base and a commitment to civic responsibility, improving life chances, raising aspirations and contributing to economic prosperity and innovation.
- 2.2 We welcome the opportunity to respond to the Select Committee's call for evidence on the Science budget and Industrial Strategy.

3. The coherence and links between the Industrial Strategy Challenge Fund and the 'sector deals'

- 3.1 We support the creation of the new Industrial Strategy Challenge Fund. To maximise the effectiveness of this fund, we would encourage the Government to ensure it takes a truly interdisciplinary approach, not just focusing on STEM disciplines but also recognising the crucial role the arts, humanities and social sciences play in understanding technological or digital advances, taking part in these developments and ensuring they can be widely adopted and deliver real benefits.
- 3.2 With regard to sector deals, we welcome the ambition and vision set out in the Life Sciences Industrial Strategy. As the Strategy acknowledges, the key UK attribute driving success in life sciences is the great strength in university-based research and we hope to see many of the Strategy's recommendations, particularly those around the Charity Research Support Fund (CRSF), incorporated into UK Research and Innovation's (UKRI) research strategy.

4. The rationale and coherence for the distribution of funding:

- **between the Industrial Strategy Challenge Fund (and its individual ISCF schemes) and the rest of the Science budget;**
- **between the various initiatives to financially support innovation and commercialisation of research;**
- **between the two arms of the 'dual support' system — funding via the research councils and funding via Research England;**
- **between innovation and research.**

- 4.1 Funding for basic research supports long-term innovation by providing a training ground for individuals and the basis for advances in knowledge and understanding that have the power to transform the lives of individuals and the fortunes of the economy.
- 4.2 For example, the development of insulin drugs used to treat millions of diabetic patients worldwide, with drug sales totalling over \$6 billion annually, is based on basic research which took place over decades and collaboration spanning over 16 years between the University of York's Structural Biology Laboratory and the pharmaceutical company Novo-Nordisk. Similarly, graphene, the disruptive technology discovered at the University of Manchester, is now finding applications in everything from water filtration systems to high-end engineering and could create an impact of the scale last seen with the Industrial Revolution.
- 4.3 It is critical there is sustained investment in fundamental, curiosity-driven research to allow these kinds of ground-breaking advances to be made. Whilst Russell Group analysis shows

impacts can be delivered in a relatively short time in some cases, UK research policy should avoid being driven by short-term needs and problems.³

- 4.4 The UK's dual support system of funding for university research plays an essential part in sustaining research of the highest quality. We therefore welcome the legislative protection for the balanced funding principle given in the Higher Education and Research Act, which is defined in section 103 as follows:

The “balanced funding principle” is the principle that it is necessary to ensure that a reasonable balance is achieved in the allocation of funding as between—
(a) functions exercisable by the Councils mentioned in section 95(1) pursuant to arrangements under that section, and
(b) functions exercisable by Research England pursuant to arrangements under section 97.4

- 4.5 Legally, therefore, “balanced funding” only involves balancing Research Council funding against other types of funding distributed by Research England. A potential concern, therefore, is the extent to which UKRI might fund programmes directly (i.e. without involving the Research Councils) and thus not be required to make a concomitant balanced funding investment. The implications of this need to be monitored carefully, and similarly if funding for the Research Councils is reduced in favour of UKRI-level programmes over time – in both cases this could undermine the sustainability of the UK's research landscape.
- 4.6 The current balance between funding for basic research and funding for innovation is about right, but how that funding is distributed also matters. In particular, it is essential the Government's Industrial Strategy recognises the vital role played by ‘Quality Related’ (QR) funding and the Higher Education Innovation Funding (HEIF) in supporting innovation and the UK's long-term ability to remain internationally competitive.

QR funding

- 4.7 QR funding supports strategic thinking, planning and action by giving universities the flexibility to deploy resources into cutting-edge new research areas (including interdisciplinary research) and allowing them to respond quickly to emerging research and innovation opportunities. In this way, it complements a challenge-based approach to research funding by ensuring there is a sustainable pipeline of new ideas to underpin innovation in areas which may not yet have emerged as the global challenges of the future.
- 4.8 QR funding is also used to develop collaborations and partnerships with a range of other organisations. While businesses, for example, may find it challenging to invest in risky research, or projects with medium- to long-term returns, QR funding allows universities to share this risk via co-funding, helping to facilitate university-business collaborations. Indeed, there is a positive relationship between QR per head and the generation of ‘Third Stream’ (e.g. business and charity) income per head – the more QR allocated to an institution, the more evidence of external organisations being willing to pay for a range of research-related

³ Analysis of 240 Russell Group REF impact case studies shows that the ‘time-to-impact’ from the start of research to the delivery of the first main non-academic impact is on average eight years, with time differences ranging from less than one year to 29 years. See our report ‘Engines of growth: The impact of research at Russell Group universities’ (November 2015):

<http://russellgroup.ac.uk/policy/publications/engines-of-growth-the-impact-of-research-at-russell-group-universities/>

⁴ Higher Education and Research Act 2017: <https://www.legislation.gov.uk/ukpga/2017/29/contents>

activities and to engage in research commercialisation.⁵ The business support element of QR funding is especially valuable in this respect.

Charity Research Support Fund

- 4.9 Recently, the Life Sciences Industrial Strategy⁶ highlighted the importance of the Charity Research Support Fund (CRSF) as a key element within QR supporting universities to work with research-funding charities in the UK. Charities play an integral part in the UK's science and innovation funding landscape – in particular, in medical research, but also in engineering, the environment and the social sciences – often investing in novel and higher-risk research that might not otherwise attract direct public funding, even if the potential returns may be higher.
- 4.10 In 2016/17, HEFCE allocated £198 million via the CRSF to help universities cover some of the costs of research that charities might not be able to cover themselves (e.g. much of the indirect costs associated with projects). However, CRSF funding has remained essentially flat since 2010. This means the real value of the CRSF has been eroded over time: first through the effects of inflation, which means the CRSF now only has a buying power of around 80% of its value in 2010; and second because the amount of research funding available from research charities has increased over time, thus diluting the CRSF contribution per pound of funding won.
- 4.11 We strongly support the recommendation in the Life Sciences Industrial Strategy to enhance CRSF in order to maintain the competitiveness of the UK research base and tap into available research funding from the UK's research charities. Without this support, there is a real concern that additional research investment by the major charities could go overseas. We therefore recommend the Government consider boosting the CRSF with new money from the £4.7bn additional investment for this parliament and then protect its value by:
- Ensuring the overall Charity Research Support Fund increases with inflation (noting that the science and research resource budget within which the CRSF sits has itself been given very welcome real-terms protection by the Government), and
 - Providing flexibility to allow the CRSF to grow in future in line with charity investment above inflation so long as additional funding is available.

Higher Education Innovation Fund

- 4.12 The Higher Education Innovation Fund (HEIF) is valuable because it has proven over many years to be highly effective at encouraging the development of knowledge-based interactions between universities and businesses. We therefore welcome the recent £40 million increase to HEIF taking the value of the fund to £200 million a year.
- 4.13 Evidence shows every £1 of HEIF funding results in a return on investment of £9.70 in benefits for the economy and society.⁷ On this basis, increasing HEIF funding to £250 million per year could lead to benefits of around £2.4 billion (and probably more, depending on how it is targeted), and lifting the caps on the amounts of funding available to individual universities would allow universities with the most success in this area to do even more. In

⁵ *A Review of QR Funding in English HEIs: Process and Impact* – a report to HEFCE by PACEC and Centre for Business Research, Cambridge (December 2014).

⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/640696/life-sciences-industrial-strategy.pdf - Life Sciences Industrial Strategy (Aug 2017)

⁷ 'Assessing the Economic Impacts of the Higher Education Innovation Fund: a Mixed-Method Quantitative Assessment' (October 2015).

addition, funding of this nature should be consistently available across the UK, as previously recommended by the House of Commons Science and Technology Committee in March 2017.⁸

5. The balance between different parts of the country in Government funding of research/innovation, the effectiveness of such place-based financial support, and how planned place-based funding might affect that balance in future

- 5.1 Russell Group universities are drivers of ‘place’-based innovation, working with LEPs, City Regions, local authorities and others to provide local leadership and help to develop local innovative capacity and promote the creation of highly-skilled jobs.
- 5.2 At the same time, it should be borne in mind that our universities deliver impact well beyond their local economies and regions. Through our collaborations with industry, charities, public bodies and other universities, we create positive economic and social benefits in all parts of the country – and indeed overseas too, forming a vital part of the UK’s soft power advantage.
- 5.3 The links our universities create spread far and wide in the UK, rather than being confined to one area. For example, the University of Leeds is renowned for its work for the North Sea oil and gas industry; the University of Birmingham’s High Temperature Research Centre is a joint partnership with Derby-based Rolls Royce, and the University of Liverpool is working with Kent Police to provide solutions to criminal justice and terror incidents.
- 5.4 Many Russell Group universities have engaged in the Science and Innovation Audits (SIAs) and we hope SIAs will be used effectively to identify areas of genuine research and innovation strength across different parts of the county and enable them to develop further with appropriate support.
- 5.5 The Government is looking to replace EU Structural and Investment Funds (ESIFs) with a new Shared Prosperity Fund (SPF). Using the new SPF to invest in research, innovation, education, skills and training will deliver long-term economic dividends. Consideration should therefore be given to ring-fencing a minimum proportion of the SPF funding for innovation-related activities (as is currently the case with ESIFs).
- 5.6 In addition, whilst the SPF should have a regional focus and be allocated proportionately to those parts of the UK where additional investment is most needed, where funding is used for research and innovation a focus on excellence should be maintained. This will help ensure that capacity and capability building draws on, and enhances, the centres of excellence and emerging industries within a particular area. Close consultation with local partners (including universities) will help to target funds appropriately – for example, the Science and Innovation Audits could be used to identify areas of local R&I strength which could be built on through the new SPF.

6. Further measures the Government should take to use its spending and facilities to strengthen innovation, research and associated ‘place’-based growth

- 6.1 In our response to the Industrial Strategy Green Paper earlier this year we outlined further suggestions which could be considered to support increased commercialisation of research and translation of research discoveries into new businesses, including:⁹

⁸ ‘Managing intellectual property and technology transfer’ (8 March 2017).

⁹ More information is available in the response here: <https://www.russellgroup.ac.uk/media/5488/russell-group-industrial-strategy-response-april-2017.pdf>

- Reforming the R&D tax environment, including introducing a targeted VAT exemption for new university buildings used for collaboration with business and simplifying the eligibility criteria for the Research and Development Expenditure Credit (RDEC) so that all research business conducts with universities is automatically eligible for tax relief
- Creating a proof of concept fund available across the research spectrum to help take research ideas through to commercialisation
- Ensuring universities maintain autonomy to manage their own intellectual property (IP)
- Exploring ways to reduce the time and effort required to establish a Knowledge Transfer Partnership (KTP) and consider how to raise greater awareness with the SME community
- Optimising access and use of Impact Accelerator Accounts (IAAs) by supporting the creation of a cross-Research Council IAA through UKRI

6.2 The UK Research Partnership Investment Fund (RPIF) has also been a successful initiative in helping universities to leverage significant external investment into projects (from business and other partners) in order to multiply initial public investment. For example, £11 million was provided to support the Materials Innovation Factory at the University of Liverpool, a £65 million partnership between the university, Unilever and HEFCE to develop a unique materials chemistry research hub to accelerate research and reduce new product discovery times. Having universities lead these projects is important as this is where the highest-quality specialist research expertise is found. As suggested by the Industrial Strategy Green Paper, a lower qualification level for project funding would be helpful so projects at a range of different scales can be supported, however the current focus of RPIF should be maintained.

Developing the pipeline of talented researchers

- 6.3 Postgraduate research students are vital to the economy and to maintaining and enhancing the country's strengths in research and innovation. We welcome the Government's recognition of this by providing £90 million to fund an additional 1,000 PhD places in areas aligned with the Industrial Strategy. Whilst we support the Government's intention to boost STEM skills, the value, impact and importance of supporting the next generation of talent in the social sciences, arts and humanities should not be underestimated. For every £1 spent on research by the Arts and Humanities Research Council (AHRC), the nation derives around £10 of immediate benefit and a further £15-£20 of long-term benefit.¹⁰
- 6.4 In addition to this new PhD funding, investment could be boosted in the next generation of research and innovation leaders by allowing a portion of the Apprenticeship Levy to be invested in the training and career development of postgraduate researchers. The most efficient and effective way of targeting investment would be to use the tools and channels the Government already has at its disposal via the Research and Funding Councils (and in future by UKRI). The Apprenticeship Levy should also be used to boost support for the development of new degree apprenticeships, as the small competitive pot of funding currently available is inadequate to maximise the potential in this area.
- 6.5 The Spring Budget announcements around support for global research talent were also very welcome. We hope this funding will be used to support PhD students and postdoctoral researchers, as well as senior researchers, as attracting and sustaining the talent pipeline at all career levels is important for the future sustainability of the research base. A strong base of talent from around the world enables research-intensive universities to remain globally competitive and is fundamental to the excellence in research, innovation and education that helps drive economic growth.

¹⁰ 'Leading the world: The economic impact of UK arts and humanities research' (2009).

Role of the EU in supporting research and innovation

- 6.6 EU staff members make a significant contribution to our universities, accounting for 22% of the overall academic workforce at Russell Group universities.¹¹ Ensuring a sustainable pipeline of international talent beyond Brexit will mean future graduates are taught by the leading global experts in their fields, especially in subjects vital to the economy, such as STEM and modern languages, and our research base will be enhanced by attracting the brightest minds to carry out pioneering research here.
- 6.7 There are currently around 61,000 students of other EU nationalities at Russell Group universities. EU-domiciled students make up 6% of our undergraduates, 9% of postgraduate taught students and 16% of postgraduate research students.
- 6.8 We agree with the concerns raised in the Life Science Industrial Strategy that the potential disruption associated with Brexit could lead to some loss of talent from the sector. We therefore strongly support the recommendation to ensure we can bring high-level talent into the country, including through specific programmes such as the Rutherford Fund. We also welcome the proposal to reduce barriers to recruiting non-UK nationals through simplifying the Tier 2 visa process. In evidence to the House of Commons Home Affairs Select Committee inquiry into immigration earlier this year we identified a series of broad principles we would want to see in a future immigration system, which would support the recruitment of international talent into the life sciences sector and the UK research base more widely.¹²
- 6.9 EU funding for research is also critical and we support the Government's desire to reach an ambitious agreement with the EU on science and innovation cooperation. To this end, we urge the Government to negotiate the UK's continued participation in the Horizon 2020 programme from the date of EU exit to the end of the programme and to prioritise negotiating the UK's full access to and appropriate influence over future EU research and innovation programmes and infrastructures with a focus on excellence.

Skills

- 6.10 Russell Group universities teach strategically important subjects at the highest level and with a reputation for quality, drawing on cutting-edge research and links with business, the NHS and many others to create a research-intensive learning environment. Our universities train almost a third of all science and engineering graduates in the UK, including 56% of graduates in mathematical sciences; they are especially important in providing postgraduate research (PGR) training – for example, 53% of biological sciences PGR students are at Russell Group universities.¹³
- 6.11 The Government already provides essential top-up funding for medicine and some STEM subjects reflecting the additional costs involved in how they are taught, but increased student numbers has led to less funding being available per student in recent years. Ultimately this will have knock-on consequences for the quality of teaching unless a new long-term commitment can be made to boost and then maintain funding levels per student – thus helping underpin growth in this high-level skills pipeline to meet the STEM skill needs of employers.

¹¹ In some disciplines this is much higher e.g. 39% of economics academics, 37% of modern languages academics, 32% of IT and computer software engineering academics and 31% of mathematics academics are EU nationals – HESA staff data 2015/16.

¹² A copy of this evidence is available online here: <http://russellgroup.ac.uk/media/5463/home-affairs-select-committee-response-on-immigration-inquiry.pdf>

¹³ 2015/16 HESA Student record.